

Claims

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ART 34 AMDT

1. An isolated DNA comprising a nucleotide sequence that encodes CobR which is a transcriptional activator for genes involved in vitamin B₁₂ synthesis, selected from the group consisting of:
 - 5 (a) a DNA sequence identified by SEQ ID NO: 1 or the complementary strand thereof;
 - (b) a DNA sequence which hybridizes under stringent conditions to the DNA sequence complementary to the DNA sequence defined in (a) or a fragment thereof, and encodes a polypeptide having the activity of the transcriptional activator CobR for genes involved in vitamin B₁₂ synthesis;
 - 10 (c) a DNA sequence which codes for a polypeptide having the amino acid sequence encoded by the DNA sequence of (a) or (b);
 - (d) a DNA sequence which is identical to the extent of at least 80% to a DNA which codes for a polypeptide which comprises the amino acid sequence of SEQ ID NO: 2;
 - (e) a DNA sequence which is identical to the extent of at least 90% to a DNA which codes
 - 15 for a polypeptide which comprises the amino acid sequence of SEQ ID NO: 2;
 - (f) a DNA which codes for a polypeptide which comprises an amino acid sequence which is identical to the extent of at least 80% to the amino acid sequence of SEQ ID NO: 2, the polypeptide preferably having the activity of the transcriptional activator CobR for genes involved in vitamin B₁₂ synthesis;
 - 20 (g) a DNA which codes for a polypeptide which comprises an amino acid sequence which is identical to the extent of at least 95% to the amino acid sequence of SEQ ID NO: 2, the polypeptide preferably having the activity of the transcriptional activator CobR for genes involved in vitamin B₁₂ synthesis.
2. A vector or plasmid comprising the isolated DNA of any one of (a) to (g) in claim 1.
- 25 3. A host cell transformed or transfected by the isolated DNA as claimed in any one of (a) to (g) in claim 1 or by the vector or plasmid as claimed in claim 2.
4. A polypeptide encoded by the isolated DNA as claimed in any one of (a) to (g) in claim 1.
5. A process for the production of the polypeptide as claimed in claim 4 having activity of
- 30 transcriptional activator for genes involved in vitamin B₁₂ synthesis, which comprises culturing the host cell as claimed in claim 3 under the condition conducive to the production of said polypeptide, wherein the host cell is selected from the group consisting

of *Pseudomonas denitrificans*, *Agrobacterium radiobacter*, *Agrobacterium tumefaciens*,
Escherichia coli, and *Sinorhizobium meliloti*.

6. A process for the biological production of cobalamin which comprises introducing the
isolated DNA as claimed in any one of (a) to (g) in claim 1 into an appropriate host
5 organism, cultivating the host organism under the condition conducive to the production
of cobalamin and recovering cobalamin from the culture.

7. The process of claim 6, wherein said host organism is *Pseudomonas denitrificans*,
Agrobacterium radiobacter, or *Sinorhizobium meliloti*.

8. The process of claim 6, wherein said host organism is *Pseudomonas denitrificans* CEEX6
10 or *Pseudomonas denitrificans* PF1-48, both deposited with the DSMZ under the Budapest
Treaty.

9. A process for discovering genes involved in vitamin B₁₂ biosynthesis by using binding
activity of the polypeptide as claimed in claim 4 against vitamin B₁₂ biosynthesis genes.
